I (WE) CLAIM:

1. A method of manufacturing a backing block, the method comprising:

(a) stacking multiple pieces of acoustic attenuating material with flexible circuit material; and

(b) connecting the stacked materials together.

2. The method of Claim 1 wherein (a) comprises aligning the pieces of acoustic attenuating material and flexible circuit material with at least one tooling hole.

3. The method of Claim 1 wherein (a) comprises stacking M layers of flexible circuit material alternating with M+1 layers of acoustic attenuating material.

4. The method of Claim 3 further comprising:

(c) positioning a layer of transducer material across the stack of (a), at least a portion of the flexible circuit material sandwiched between acoustic attenuating material being substantially perpendicular to a bottom surface of the transducer material; and

wherein (a) comprises stacking with a pitch of the layers of flexible circuit material a substantially same pitch as elements formed in the transducer material along a first dimension.

5. The method of Claim 4 further comprising:

(d) forming the elements in the transducer material as a multi-dimensional array;

wherein traces in the flex circuits have a substantially same pitch as elements along a second dimension different than the first dimension.

6. The method of Claim 1 wherein (b) comprises bonding the materials together.

7. The method of Claim 1 further comprising:

(c) flattening a surface of the connected materials, the surface having both acoustic attenuating material and flexible circuit material exposed.

8. The method of Claim 1 further comprising:

(c) plating exposed traces of the flexible circuit material.

9. The method of Claim 1 further comprising:

(c) stacking the connected materials with a layer of transducer material, the layer of transducer material substantially orthogonal to traces of the flexible circuit material sandwiched between the acoustic attenuating material; and

(d) bonding the connected materials with the layer of transducer material.

10. The method of Claim 9 further comprising:

(e) dicing the layer of transducer material into a multi-dimensional array of elements after (d);

wherein (a) comprises stacking at least two layers of flexible circuit material, traces from the at least two layers of flexible circuit material aligned with respective elements.

11. The method of Claim 1 further comprising:

(c) terminating the flexible circuit material at a bottom surface of the connected materials.

12. The method of Claim 1 further comprising:

(c) diverging a first flexible circuit from a second flexible circuit within the backing block.

13. A backing block for z-axis electrical connection, the block comprising:

a plurality of flexible circuits each having a plurality of electrical traces; and

a plurality of separate pieces of acoustic attenuating material alternating with the flexible circuits, the electrical traces exposed on a first surface from between the layers of acoustic attenuating material and the flexible circuits extending from the acoustic attenuating material on a side opposite the first surface.

14. The backing block of Claim 13 wherein the electrical traces on the first surface have a first pitch along at least a first dimension and the flexible circuits have a second pitch greater than the first pitch along the first dimension on the side opposite the first surface.

15. A transducer stack for electrical connection, the stack comprising:

a transducer array of elements; and

a backing block comprising alternating layers of acoustic attenuating material and electrical trace supporting material, each layer of acoustic attenuating material being a separate block of acoustic attenuating material, the backing block adjacent to the elements and the electrical trace supporting material extending substantially along a z-axis from the elements and diverging from the z-axis within the backing block.

16. The transducer stack of Claim 15 wherein the electrical trace supporting material comprises a flexible circuit.

17. The transducer stack of Claim 15 wherein the transducer array comprises a multidimensional array of elements and wherein a pitch of the alternating layers at the elements is substantially the pitch between the elements along at least one dimension.

18. The transducer stack of Claim 15 wherein the transducer array comprises a multidimensional array of MxN elements and wherein a first number layers of electrical trace supporting material is about M and a second number of electrical traces on each layer of the electrical trace supporting material is about N.

19. The transducer stack of Claim 18 wherein about M+1 layers of the acoustic attenuating material alternate with the about M layers of electrical trace supporting material.

20. The transducer stack of Claim 15 further comprising a plurality of electrical traces supported by the layers of electrical trace supporting material, the plurality of electrical traces extending substantially orthogonal to a bottom surface of transducer array, the elements spaced along the bottom surface.

21. The transducer stack of Claim 15 further comprising:

an electrode on the bottom surface for each of the elements;

wherein each of the electrical traces is plated at a portion adjacent to a respective electrode.

22. The transducer stack of Claim 15 wherein the alternating layers are bonded together.

23. The transducer stack of Claim 15 wherein the layers of acoustic attenuating material comprise plates of material and the layers of electrical trace supporting material comprise sheets of material with traces, each of the layers of electrical trace supporting material at least partially sandwiched by two different layers of the acoustic attenuating material.

24. The transducer stack of Claim 15 wherein at least two layers of electrical trace supporting material diverge by different amounts from orthogonal to the elements.

25. The transducer stack of Claim 15 wherein the electrical trace supporting material comprises the layers of acoustic attenuating material, at least one of the layers of acoustic attenuating material having a plurality of grooves with electrical traces within the grooves.

26. The transducer stack of Claim 15 wherein the electrical trace supporting material terminates at a surface of the backing block.